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~~"Rear derailleur for bicycle gear changes"~~

a BACKGROUND OF THE ***INVENTION

The present invention relates to a rear derailleur for bicycle gear changes.

Bicycle derailleurs comprise a top body which is designed to be fixed to the bicycle frame and which is referred to as "hanger bracket", and a bottom body, referred to as "pulley-cage bracket", which carries a rocker member that in turn carries two idler wheels that co-operate with the chain. The pulley-cage bracket is connected to the hanger bracket by means of an articulated-parallellogram mechanism comprising a first link and a second link. The said links are articulated to the hanger bracket and the pulley-cage bracket by means of pins which define the axes of articulation of the articulated-parallellogram mechanism.

In higher-quality derailleurs, the hanger bracket, pulley-cage bracket and the links of the articulated-parallellogram mechanism are made of light metal alloys, such as aluminium alloys or the like. Articulation of the links of the articulated-parallellogram mechanism to the hanger bracket and pulley-cage bracket is obtained by inserting axially the pins inside aligned holes of one of the brackets and one of the links. Each pin is constrained against sliding out in the direction of its own axis by means of plastic deformation of one or both of its ends against a surface of the hanger bracket or of the pulley-cage bracket, or else by means of a knurling of the pin which interferes with a corresponding wall of a hole made in one of the bodies. The deformation of the ends of the pins against the hanger bracket or the pulley-cage bracket, or else the drive fit of a knurled portion of the pin in a hole, does not create any problem in the case where the said bodies are made of metal material. It has, however,

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been found that the traditional method of axial constraint of the pins gives rise to problems of initiation of failure or cracking in the case where the hanger bracket or pulley-cage bracket is made of plastic material.

a SUMMARY OF THE INVENTION

The purpose of the present invention is to overcome the aforesaid drawback by proposing a rear derailleur having the characteristics that form the subject of the main claim.

a BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described in detail with reference to the attached drawings, provided purely by way of non-limiting example, in which:

- Figure 1 is a rear perspective view of a derailleur according to the present invention;

- Figure 2 is a front perspective view of the derailleur of Figure 1;

- Figures 3 and 4 are sectional views taken along the lines III-III and IV-IV of Figures 1 and 2, respectively;

- Figures 5 and 6 are views at a larger scale of the pins used in the derailleur according to the present invention;

- Figure 7 is a sectional view, taken along the line VII-VII of Figure 8, of a retaining washer according to the invention; and

- Figure 8 is a front view of the washer of Figure

a 7. DETAILED DESCRIPTION OF THE INVENTION

With reference to Figures 1 and 2, number 10 designates a rear derailleur for a bicycle gear change. The derailleur 10 comprises, in a way of itself known, a top body or hanger bracket 12, a bottom body or pulley-cage bracket 14, and an articulated-parallellogram mechanism 16 which connects the pulley-cage bracket 14 to the hanger bracket 12.

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The articulated-parallelogram mechanism 16 comprises a front link 26 and a rear link 28. The links 26, 28 are articulated to the hanger bracket 12 and to the pulley-cage bracket 14 by means of respective pins 30, 32.

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diameter of the cylindrical surfaces of the pins 30, 32. In the case of the pins 30 which provide the articulation of the front link 26 to the hanger bracket 12 and to the pulley-cage bracket 14, the circumferential groove 36 is provided in a central portion of the pin. The washer 34 is housed in a groove or notch 46 made in the top or bottom end portion of the front link 16. In the case of the pins 32 which provide the articulation of the rear link 28 to the hanger bracket 12 and to the pulley-cage bracket 14, the annular groove 36 is made in the vicinity of one end of the pin, and the washer 34 is housed between two surfaces facing one another of the link 28 and of the bracket 12 or 14 (Figure 3).

Assembly of the derailleur 10 is carried out by positioning the washer 34 in such a way that its central hole 44 is aligned with the hole 48 of the hanger bracket 12 or pulley-cage bracket 14 and with the hole 50 of the front link 26 or rear link 28. The pin 30 or 32 is then inserted in the direction of its own axis into the aligned holes 48, 44 and 50. The pin must be driven in with a certain amount of force in order to produce elastic deformation of the deformable portions 40. To prevent any damage to the washer, each pin is provided with a lead-in chamfer 52 on one or both of its ends. The deformable portions 40 engage by snap action inside the annular groove 36 of the pin 30 or 32 as soon as the said groove arrives at the deformable portions 40. At this point, the assembly is completed in so far as the washer 34 is fixed integrally with the pin 30 in the axial direction and constitutes a radial shoulder that prevents any sliding-out of the pin 30 or 32 in the direction of the axis of the latter. The annular groove 36 of the pin 30 or 32 is shaped in such a way as to establish a shape

fit with the corresponding part of the washer. Preferably, the groove 36 has angles 54 substantially of 90°, so that the force required for sliding the pins out is higher than the force required for driving them in.

The solution according to the invention is also advantageous from the aesthetic point of view in so far as the pins 30, 32 may be without any end portions protruding outside the bracket 12 or 14.

Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary widely with respect to what is described and illustrated herein, without thereby departing from the scope of the present invention as defined in the ensuing claims.

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